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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/822,339

04/12/2004

Norio Watanabe

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12/06/2005

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EXAMINER

DOUGHERTY, THOMAS M

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 12/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/822,339

Applicant(s)

WATANABE, NORIO

Examiner

Thomas M. Dougherty

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2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/12/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>404</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 7, 8, 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claims 7 and 15 there is no proper antecedent basis in the specification for citation of "a thin metal film having a thickness of about 3% of a thickness of the piezoelectric substrate" in the disclosure. Page 5 of the disclosure notes however that the "thickness of the metal film is about 3% of a wavelength of a selected surface acoustic wave". There is no proper antecedent basis for the citation of "the thin metal film" in the claims 8 and 16.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 8 (as best understood), 9-12 and 16 (as best understood) are rejected under 35 U.S.C. 102(b) as being anticipated by Kajihara et al. (US 5,559,483). Kajihara et al. show (figs. 4-6) a surface acoustic wave device comprising: first and second double-mode surface acoustic wave resonator filters (21, 23) connected in

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parallel to each other, each of said first and second double-mode surface acoustic wave resonator filters (21, 23) including a piezoelectric substrate (19), IDT electrodes (25, 27, 33, 35) and grating reflectors (29, 31, 37, 39) disposed on the piezoelectric substrate (19); wherein the first double-mode surface acoustic wave resonator filter (21) has resonance frequencies f_{1L} (13L in fig. 5) and f_{1H} (11L in fig. 5), where $f_{1L} < f_{1H}$; the second double-mode surface acoustic wave resonator filter (23) has resonance frequencies f_{2L} (13H in fig. 6) and f_{2H} (11H in fig. 6), where $f_{2L} < f_{2H}$; $f_{1H} = f_{2L}$ (as shown 11L + 13H); and an energy transmittance of the reflectors (29, 31, 37, 39) in at least one of the first and the second double-mode surface acoustic wave resonator filters (21, 23) ranges from about 12% to about 28%. Note that as Kajihara et al. show all the claimed structural features, the goal noted by the applicants here is regarded as being met by Kajihara et al.

A fractional bandwidth that is a ratio of a passband to the center frequency of the passband ranges from about 0.18% to about 0.22%. Again note that as Kajihara et al. show all the claimed structural features, the goal noted by the applicants here is regarded as being met by Kajihara et al.

The first double-mode surface acoustic wave resonator filter (21) and the second double-mode surface acoustic wave resonator filter (23) are disposed on the same piezoelectric substrate (19).

The piezoelectric substrate is a quartz substrate. See col. 4, ll. 56-57.

The thin metal film primarily includes Al. See col. 5, lines 53-58.

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Kajihara et al. show (figs. 4-6) a surface acoustic wave device comprising: first and second double-mode surface acoustic wave resonator filters (21, 23) connected in parallel to each other, each of said first and second double-mode surface acoustic wave resonator filters (21, 23) including a substrate (19), IDT electrodes (25, 27, 33, 35) disposed on the piezoelectric substrate (19), and grating reflectors (29, 31, 37, 39) on both sides of a region where the IDT electrodes (25, 27, 33, 35) are disposed in the surface acoustic wave propagation direction; wherein the first double-mode surface acoustic wave resonator filter has resonance frequencies f_{1L} (13L in fig. 5) and f_{1H} (11L in fig. 5), where $f_{1L} < f_{1H}$; the second double-mode surface acoustic wave resonator filter (23) has resonance frequencies f_{2L} (13H in fig. 6) and f_{2H} (11H in fig. 6), where $f_{2L} < f_{2H}$; $f_{1H} = f_{2L}$; and a Q factor of a resonance mode of one of the first and the second double-mode surface acoustic wave resonator filter (21 or 23) is less than a Q factor of a resonance mode of the other double-mode surface acoustic wave resonator filter (23 or 21). Again note that as Kajihara et al. show all the claimed structural features, the goal noted by the applicants here is regarded as being met by Kajihara et al.

A fractional bandwidth that is a ratio of a passband to the center frequency of the passband ranges from 0.18% to 0.22%. Again note that as Kajihara et al. show all the claimed structural features, the goal noted by the applicants here is regarded as being met by Kajihara et al.

The first double-mode surface acoustic wave resonator filter (21) and the second double-mode surface acoustic wave resonator filter (23) are disposed on the same piezoelectric substrate (19).

The piezoelectric substrate (19) is a quartz substrate. See col. 4, ll. 56-57.

The thin metal film primarily includes Al. See col. 5, lines 53-58.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5, 6, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kajihara et al. (US 5,559,483). Given the invention of Kajihara et al. as noted above, they do not note the piezoelectric substrate is an LiTaO₃ substrate or an LiNbO₃ substrate.

It would have been obvious to one having ordinary skill in the art to employ either LiTaO₃ or LiNbO₃ for the substrate in the invention of Kajihara et al. at the time of that invention since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Claims 7 and 15, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kajihara et al. (US 5,559,483) in view of Oshio (US

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2004/0164645) Given the invention of Kajihara et al. as noted above, the "thickness of the metal film is about 3% of a wavelength of a selected surface acoustic wave.

Oshio notes at paragraph [0047] that the normalized his electrode thickness is set to .02 or more. He doesn't show a double-mode surface acoustic wave device.

It would have been obvious to one having ordinary skill in the art to arrange the "thickness of the metal film is about 3% of a wavelength of a selected surface acoustic wave" in the device or Kajihara et al. as is taught by Oshio (2% or greater), in the Kajihara et al. device at the time of that invention since this is a result effective variable which influences electro-mechanical capabilities as Oshio notes in his SUMMARY OF THE INVENTION. It would further have been obvious to one having ordinary skill in the art to so arrange the relationship between the film thickness and wavelength since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hiramoto (US 5,909,158) teaches interchangeability of any of quartz, LiTaO₃ or LiNbO₃ at col. 4, lines 1-5 in a dual mode resonator filter structure with the same design as that of the Applicants. Kando et al. (US 2004/0061575) note a thickness to wavelength ratio of their electrode film to be about 0.035, thus about .03, at paragraph [0095]. Yamamoto et al. (5,666,092) teach in at least claim 1, the

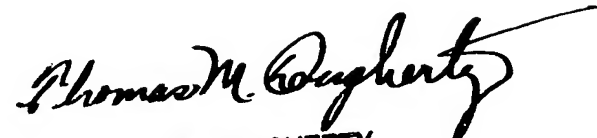
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relationship between the spacings of components in a dual-mode surface acoustic wave device and frequency response.

Direct inquiry to Examiner Dougherty at (571) 272-2022.

~~tmd~~
tmd

December 1, 2005


TOM DOUGHERTY
PRIMARY EXAMINER